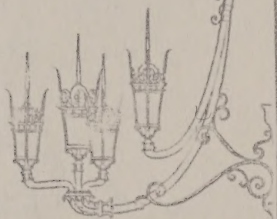


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**Impact of the Mega Projects and other Infrastructure Improvements on
the Boston Economy in the 1990s**

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January 3, 1991

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Public Capital Infusion Into the Boston Economy in the 1990s¹

Overview

The Boston Metropolitan Area houses roughly half the population of the Commonwealth of Massachusetts, but the region generates nearly three-quarters of the total Gross State Product. These statistics suggest that the Boston Metropolitan Economy is the engine of the Massachusetts Economy.

At the present time the Boston Metropolitan region is reaching the capacity of its infrastructure to absorb future economic growth. Without an increase in the capacity of the region's infrastructure the Boston Metropolitan Region and the Commonwealth of Massachusetts will have limited prospects for future economic growth.

Fortunately for the Boston Area and the Commonwealth, there are engineering and planning solutions to the infrastructure capacity problems. At the same time political and fiscal solutions have been developed how to finance these infrastructure improvements. These financing solutions involve the cooperation of the federal, state and regional agencies as well as private financing in the bond market. By bringing all these forces together the regional infrastructure capacity can be boosted and future economic growth can occur which will benefit the metro region and the Commonwealth.

There are three major areas where the infusion of public capital for expanding infrastructure capacity will be spent. The first area is transportation which includes the depression of the Central Artery, a cross harbor tunnel, bridges, roadways, commuter rail lines, parking garages, and a second regional airport. The second area is water resources which

¹ This paper is from The Howell Report: Technical Appendix, Volume Two, Boston Redevelopment Authority, November 8, 1990.

includes waste water treatment systems and storm water control projects. The third area is other public facilities which includes schools, jails, housing, and economic development.

A recent study by Alicia H. Munnell of the Federal Reserve Bank of Boston, published in the New England Economic Review, explored the impact of public capital on economic activity at the state and regional level. Munnell, Senior Vice President and Director of Research of the Bank, concluded that states that have invested in infrastructure tend to have greater output, more private investment, and more employment growth. She states that "the evidence seems overwhelming that public capital has a positive impact on private sector output, investment, and employment."²

It is clear that once the planned capital infusion for the metro Boston region has been administered and the capacity of the region's infrastructure has increased, the metro area can continue to develop economically. This will enable the region to take advantage of the opportunities that the "New Economy" will offer, such as business and institutional expansion and the accompanying job growth. At the same time, this infusion of capital along with growth in the institutional and private sectors of the economy will provide a counter-cyclical economic impact that will aid the region's economic recovery.

Mega Projects

The mega projects which include the Boston Harbor Clean-up and the Central Artery Tunnel Projects are projected to cost a total of \$7.6 billion with a hard construction cost of \$6.8 billion in current dollars over the 1990-1999 period. See Table 1.

² Alicia H. Munnell, with the assistance of Leah M. Cook, "How Does Public Infrastructure Affect Regional Economic Performance?" in New England Economic Review (September/October 1990), p. 26.

Massachusetts Public Agencies

The capital needs of a variety state agencies were summed up in a report titled, "On The Job: Building The Nineties". When the mega projects are removed from the tables, expenditures for the remaining projects will average \$557 million per year in total cost and \$50 million in hard construction cost over the ten years 1990-1999. The total cost is \$5.57 billion and the total hard construction cost is \$5 billion over the period with projects construction durations of between two and ten years. See Table 2.

Boston Capital Plan

The City of Boston's Capital Planning Office will be spending a total of \$428 million and a hard construction cost total of \$364 million in the 1990-1993 period. The average annual expenditures are \$107 million per year total and \$91 million in hard construction costs per year. See Table 3.

Economic Impact of Public Capital Infusion

The direct economic impact of \$12.2 billion in hard construction spending will be felt throughout the Boston Metropolitan Region and the state as a whole through job creation, and the resulting construction earnings. The resulting full time equivalent employment will total 84,289 construction jobs. These workers will earn a combined \$3 billion in wages. See Table 4.

There will also be an indirect economic impact from this enormous capital infusion which is sometimes referred to as a multiplier effect. In total \$12.2 billion will result in nearly 342,000 full time and part time jobs, which this does include the construction workers

noted above. At the same time, these 342,000 full and part time jobs will provide a total of \$8.6 billion in earnings which includes the \$3 billion in construction wages are spent and re-spent throughout the economy. See Table 4. This \$8.6 billion is the estimated earning that will result state-wide from the total infrastructure spending over the 1990-1999 period.

Table 1: Mega-Projects Capital Investment and Employment 1990-1999

Mega-Project	Construction costs in millions of current dollars. Employment in full-time equivalent jobs.										
	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY2000 Total
Harbor Clean-Up (1)											
Capital Expenditures	\$74	\$154	\$383	\$451	\$502	\$402	\$214	\$124	\$160	\$146	\$58 \$2,785
Harbor Clean-Up (1)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000 Total
Construction Employment	244	938	1,835	2,234	1,026	860	680	860	930	616	NA 10,503
Artery/Tunnel (2)											
Capital Expenditures	\$32	\$303	\$455	\$557	\$712	\$879	\$841	\$662	\$430	\$104	NA \$4,972
Artery/Tunnel (2)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000 Total
Construction Employment	100	700	1,750	3,900	4,500	3,600	2,900	2,100	1,500	NA	NA 21,050

Capital Spending and Employment for Mega-Projects by Calendar Year 1990-1999

Calendar Period	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Total
Total Cost	\$281	\$648	\$923	\$1,110	\$1,247	\$1,168	\$921	\$688	\$420	\$154	\$7,560
Hard Cost (*)	\$253	\$583	\$831	\$999	\$1,122	\$1,051	\$829	\$619	\$378	\$139	\$6,804
Construction Employment	344	1,638	3,585	6,134	5,526	4,460	3,580	2,960	2,430	616	31,273

Note: (*) Hard cost estimated at 90 % of total cost and do not include engineering, design or site acquisition costs.

Sources: (1) MWRA: Annual Report 1989 & 5-Year Progress Report, Dec. 1989.

(2) Bechtel/Parsons Brinckerhoff, management consultants to the Central Artery Project.

Prepared By: BRA, PDR, MRJ & JEA, 11.05.90. MEGAJOB2.WK1 (HOWELL)

Table 2: Massachusetts Infrastructure Projects, 1990-2000
Excluding Central Artery/Tunnel & Harbor Clean-Up

Projects	1 9 9 0 - 2 0 0 0		
	Construction	Budget	Construction
	B=Billions	M=Millions	Jobs (2)
	Total Cost	Hard Cost (1)	
Charlestown Artery	\$350 M	\$315 M	2,182
Turnpike & Sumner- Callahan Tunnels	\$715 M	\$644 M	4,458
Other State Roads & Bridges	\$600 M	\$540 M	3,741
Other Clean Water Project	\$1.3 B	\$1.2 B	8,105
Logan Modernization & Other Massport	\$500 M	\$450 M	3,117
Old Colony Railroad	\$500 M	\$450 M	3,117
North Station Garage & Other MBTA	\$400 M	\$360 M	2,494
Public Schools	\$400 M	\$360 M	2,494
State Buildings	\$800 M	\$720 M	4,988
Total	\$5.57 B	\$5.0 B	34,695

Notes: (1) Hard construction cost calculated at 90% of total cost and do not include design, engineering, or site acquisition costs.

(2) Construction employment calculated by taking 25% of hard cost and dividing by the average annual construction wage of \$36,090 in 1990.

Source: "Massachusetts: On The Job -- Building The Nineties", Commonwealth of Massachusetts, Office of Economic Affairs, July, 1990.

Prepared By: BRA, PDR, M.R.J., 11.05.90., ONJOB TWO.WK1 (HOWELL)

Table 3: City of Boston Projected Capital Expenditures FY1990-FY1994

City of Boston 5-Year Capital Plan	Construction Budget (\$ Millions)		Estimated Construction Employment(2)
	Total Cost	Hard Cost(1)	
Capital Spending FY90	\$73.5	\$62.4	433
Capital Spending FY91	\$126.6	\$107.6	745
Capital Spending FY92	\$108.9	\$92.5	641
Capital Spending FY93	\$106.2	\$90.2	625
Capital Spending FY94	\$100.3	\$85.2	590

Capital Spending By Half-Years & Translated into Calendar Years

1990 First Half	\$36.7	\$31.2	216
1990 Second Half	\$63.3	\$53.8	373
1990 Full Year	\$100.0	\$85.0	589
1991 First Half	\$63.3	\$53.8	373
1991 Second Half	\$54.4	\$46.3	320
1991 Full Year	\$117.7	\$100.0	693
1992 First Half	\$54.4	\$46.3	320
1992 Second Half	\$53.1	\$45.1	313
1992 Full Year	\$107.5	\$91.4	633
1993 First Half	\$53.1	\$45.1	313
1993 Second Half	\$50.1	\$42.6	295
1993 Full Year	\$103.2	\$87.7	608
1990-1993 Total	\$428.4	\$364.2	2,523

Notes: (1) Hard Cost estimated at 85 percent of total cost and do not include design, engineering, or site acquisition costs.

(2) Construction employment calculated by taking 25% of hard cost and dividing by average annual construction wage of \$36,090 in 1990.

Source: "A Five-year Capital Plan Fiscal Years 1990-1994",
City of Boston, Mayor's Office of Capital Planning,
January, 1990.

Prepared by: BRA, PDR, JEA & MRJ, 11.05.90, CAPPLAN.WK1 (HOWELL).

**Table 4: Economic Impact of Massachusetts and City of Boston
Public Capital Infusion, 1990-1999**

Calendar Period	Hard Construction Cost Millions of Dollars				Construction Jobs (4)	Construction Earnings (5) (\$ Millions)	Full Economic Impact	
	Mega- Projects (1)	Mass Agencies (2)	City of Boston (3)	Total Hard Cost			Total Jobs (6)	Total Earnings (7) (\$ Millions)
1990	\$253	\$500	\$85	\$838	5,805	\$209.5	23,548	\$595
1991	\$583	\$500	\$100	\$1,183	8,195	\$295.8	33,242	\$839
1992	\$831	\$500	\$91	\$1,422	9,850	\$355.5	39,958	\$1,009
1993	\$999	\$500	\$88	\$1,587	10,993	\$396.7	44,595	\$1,126
1994	\$1,122	\$500	NA	\$1,622	11,236	\$405.5	45,578	\$1,151
1995	\$1,051	\$500	NA	\$1,551	10,744	\$387.8	43,583	\$1,101
1996	\$829	\$500	NA	\$1,329	9,206	\$332.3	37,345	\$943
1997	\$619	\$500	NA	\$1,119	7,751	\$279.8	31,444	\$794
1998	\$378	\$500	NA	\$878	6,082	\$219.5	24,672	\$623
1999	\$139	\$500	NA	\$639	4,426	\$159.8	17,956	\$453
Total	\$6,804	\$5,000	\$364	\$12,168	84,289	\$3,042	341,921	\$8,634

Notes: (1) Data and Sources in Table 1

(2) Data and Sources in Table 2

(3) Data and Sources in Table 3

(4) Full time equivalent jobs of one-year duration, calculated by taking 25 percent of total hard cost and dividing by the average construction wage of \$36,090.

(5) Construction payroll based on 25 percent of total hard cost.

(6) Total jobs based on 28.1 full time and part time jobs per million '990 dollars of total hard cost from (RIMS II) Regional Input-Output Modeling System, May 1986.

(7) Total earnings based on 70.96 percent of total hard cost being spent and re-spent in the Massachusetts economy from (RIMS II).

